Fall 2018

BIOL 630-001: Critical Thinking for Life Science

Eric Fortune

NJIT BIOLOGY

Course Syllabus

FALL 2018

BIOLOGY 630: CRITICAL THINKING FOR LIFE SCIENCE

INSTRUCTOR:	Dr. Eric Fortune (eric.fortune@njit.edu)	**OFFICE HOURS:**	By Appointment Only (Email)
COURSE SCHEDULE:	M,R: 11:30am-12:55pm in CKB 316	**COURSE WEBSITE:**	http://moodle.njit.edu/

OBJECTIVE:

The goal of this course is to prepare graduate students in understanding the scientific method, reading and critical analysis of scientific literature, and effective oral and written scientific communication in the context of biological sciences.

OUTLINE AND EXPECTATIONS:

- Each student will choose a topic of current research, choose 5-10 original research papers in this topic area, and develop a review paper and a mini grant proposal based upon their topic. This topic could be initially broad and then narrowed down after the paper presentations, but before writing the review paper and mini proposal.
- Individual assignments include:
    - Identification of 10-15 original papers that frame the current state of research on the topic.
    - Written description of the significance of the topic that justifies the choice of topic by the student.
    - In-class presentations that summarize individual papers as well as the chosen topic.
    - Write summaries of original research papers and review papers.
    - A written review paper on the chosen topic, including drafts with comments and revisions;
    - A grant proposal to continue some aspect of the chosen research topic, consisting of a Summary/Significance section and Specific Aims/Hypotheses
- **Unless otherwise noted, written assignments must be submitted via Moodle/Turnitin.**

REQUIRED TEXT:

None: Be sure to have access to Moodle (moodle.njit.edu, login with UCID).

PRESENTATIONS: There will be **three** presentation categories:

1. Presentations of individual scientific papers.
2. Presentation of the research topic.
3. Presentation of the research proposal.

CLASS PARTICIPATION:

Students are expected to attend every class meeting, participate in discussion and provide feedback and constructive criticism. This is a significant portion of your grade. Do NOT ignore it.

BIOLOGY 630: CRITICAL THINKING FOR LIFE SCIENCE

WRITTEN ASSIGNMENTS:

- **Research Topic Summary:** At the beginning of Week 2, each student will provide a written justification (i.e. significance) of their research topic and a list of 10-15 scientific papers related to the topic. This draft will be returned to you with comments. A second and third version will be due on assigned dates.

- **Summaries:** A summary of an original research paper that includes significance, main highlights of results, methodology (if relevant) and critical thoughts. A set of 2 e-summaries will be due on the first Sunday of class. An additional two sets of 5 e-summaries will be assigned during the development of the research topic. An e-summary of one published review paper will also be assigned.

- **REVIEW PAPER:** Each student will write one paper during the semester based on their topic of discussion in class and the papers they have chosen. Submit the files electronically on Moodle in Word format. The draft must include Title and Author, draft Summary, draft Introduction and highlights of the sections in the Body (see the final version instructions below) and a brief bibliography. In addition, attached as an Appendix, the draft should include e-summaries of five scientific research papers (excluding the ones presented in class) on this topic.

The **final version** should consist of:

- ❑ Title and author
- ❑ Summary (max 200 words)
- ❑ Introduction (Significance and Background)
- ❑ Body (divided into sections)
- ❑ Conclusions (leading to a scientific hypothesis)
- ❑ References (PubMed)

There will be a maximum of 3,500 words (including all the above sections except references). Papers will be submitted via *Turnitin*

- **MINI PROPOSAL INSTRUCTIONS:** Each student will write a short (2000-2500 words) description of a grant proposal to continue some aspect of the chosen research topic. This proposal will include a Summary section (including Significance) and Specific Aims and/or Hypotheses sections. The mini proposal will be due late November.
- **PEER REVIEW SUMMARIES:** Students will provide formal written feedback of both oral and written work. A written review is expected for each in-class peer review.

GRADING POLICY:

GRADE DISTRIBUTION	Percentage
Participation	10%
Presentations	25%
Written Assignments	20%
Review Paper	30%
Grant Proposal	15%
TOTAL	**100%**

A	90-100
B+	80-89
B	73-79
C+	67-72
C	59-65
F	0-58

BIOLOGY 630: CRITICAL THINKING FOR LIFE SCIENCE

IMPORTANT RULES AND POLICIES

- The Academic Integrity Code is strictly enforced.
- **Plagiarized assignments will receive an automatic zero grade; the student will receive an F in the course and will be reported to the Dean of Student Affairs.**
- There will be no make-up assignments.
- The grade of assignments/ classes missed because of a valid excuse will be determined on a case-by-case basis.

SCHEDULE AND COURSE OUTLINE:

WEEK OF		LECTURE TOPICS	NOTES
Week 1	9/6	Introduction the course	**9/3:** Labor Day – No Classes
Week 2	9/10 9/13	Lecture on communication, selection of papers; Student presentations [Draft Summaries are due]	
Week 3	9/17 9/20	Student presentations	
Week 4	9/24 9/27	Student presentations [Final Summaries are Due]; Lecture on research review [Draft Topics & references Due]	
Week 5	10/1 10/4	Relation between research and reporting [Final paper topics approved]; Short student presentations with peer review	
Week 6	10/8 10/11	Short student presentations with peer review; Peer review of research papers	
Week 7	10/15 10/18	Peer review of research papers Student presentations of research topics	
Week 8	10/22 10/25	Student presentations of research topics	
Week 9	10/29 11/1	Student presentations of research topics [Research Papers are Due]; Developing and writing a research proposal 1	
Week 10	11/5 11/8	**NO CLASS, SfN [Draft Propsals are Due] 11/5**; Developing and writing a resarch proposal 2	
Week 11	11/12 11/15	Short student presentations with peer review	
Week 12	11/19 11/22	Peer review of proposals **NO CLASS, THANKSGIVING RECESS 11/22**	**11/20:** Classes follow a **Thursday** schedule
Week 13	11/26 11/29	Peer review of proposals .	
Week 14	12/3 12/6	Student presentations of research proposals.	
Week 15	12/10	Student presentations of research proposals[Final Research Proposals are Due]	
FINAL EXAM WEEK: DECEMBER 15-21, 2018			